

Is undergraduate debt an impediment to postgraduate enrolment in England?

Article (Accepted Version)

Wakeling, Paul, Hampden-Thompson, Gillian and Hancock, Sally (2017) Is undergraduate debt an impediment to postgraduate enrolment in England? *British Educational Research Journal*, 43 (6). pp. 1149-1167. ISSN 0141-1926

This version is available from Sussex Research Online: <http://sro.sussex.ac.uk/id/eprint/69196/>

This document is made available in accordance with publisher policies and may differ from the published version or from the version of record. If you wish to cite this item you are advised to consult the publisher's version. Please see the URL above for details on accessing the published version.

Copyright and reuse:

Sussex Research Online is a digital repository of the research output of the University.

Copyright and all moral rights to the version of the paper presented here belong to the individual author(s) and/or other copyright owners. To the extent reasonable and practicable, the material made available in SRO has been checked for eligibility before being made available.

Copies of full text items generally can be reproduced, displayed or performed and given to third parties in any format or medium for personal research or study, educational, or not-for-profit purposes without prior permission or charge, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

Is undergraduate debt an impediment to postgraduate enrolment in England?

Paul Wakeling, Gillian Hampden-Thompson and Sally Hancock

Abstract

Changes to undergraduate student funding arrangements in England have prompted concerns that increased indebtedness will deter graduates from postgraduate study. While it is clear that student debt has increased substantially in recent years, international evidence is equivocal on whether such debt is a deterrent to further study and there is hardly any prior research on this topic in the UK context. Using a large-scale survey of 2009 and 2012 graduates from six selective English universities, we investigate the association between undergraduate debt, other graduate characteristics and progression to postgraduate study. We find some association of higher debt levels with lower rates of progression to postgraduate study, although this reduces when controlling for other factors, such as degree-level attainment and subject discipline. Within a multivariate logistic regression model predicting progression to postgraduate study we find that debt is not a statistically significant predictor, although other characteristics are important. This indicates, we suggest, that underlying financial resources, rather than debt *per se* are critical in enabling access to postgraduate study. We consider the implications of recently-announced loans for postgraduate study in England given these findings.

Keywords: postgraduate study, student debt, student funding, student loans

Word count: 8,000

Introduction

In this article we investigate whether higher levels of undergraduate debt are associated with a lower probability of enrolling on postgraduate degrees, drawing on new evidence from a multi-institutional study of access to postgraduate education in England. This is an important question for several reasons. Postgraduate qualifications increasingly provide a labour market advantage, being associated with access to the most highly-rewarded jobs (OECD, 2015: Table A6.1a; Walker and Zhu, 2013). Postgraduates represent the pool for supply of future knowledge workers, especially those working in higher education research and teaching. If debt accumulated from undergraduate study deters postgraduate enrolment, this presents risks to the future supply of highly-skilled labour (and indeed the creation of knowledge). If its effects are relative, then we would expect the most financially-disadvantaged graduates to be most strongly deterred or prevented from postgraduate enrolment, with attendant consequences for social mobility, social justice and the national ‘talent pool’. Given recent radical changes to student funding in England, such concerns have been expressed by numerous organisations and individuals (e.g. National Union of Students, 2012; Social Mobility and Child Poverty Commission, 2013). Commentators have pointed to the substantial debts now accrued by English graduates, together with the absence of state support for study at postgraduate master’s level. In part, these concerns have prompted an unprecedented policy intervention by the UK government in the form of student loans as a contribution towards master’s-level study in England worth £10,000, commencing in autumn 2016; and doctoral loans of £25,000 from 2018 (HM Treasury, 2016).

The evidence base on the effect of student debt on postgraduate enrolment is slim. Most previous studies focus on the USA and there is a lack of consensus on deterrent effects (English and Umbach, 2016). There are virtually no previous studies on the impact of student

debt on postgraduate enrolments in the UK and an absence of suitable datasets with which to explore the topic. Here, we present findings from a new multi-institutional study of graduates' entry to postgraduate study which included measurement of student debt alongside other relevant variables. Our dataset enables a multivariate exploration of the factors associated with progression to postgraduate study by graduates from six universities in two different years which considers varying levels of student debt. We are thus able to investigate whether students with higher levels of debt are systematically less likely subsequently to enrol on postgraduate programmes; and to determine whether debt has a differential enrolment impact on those otherwise underrepresented at postgraduate level. In so doing, we add to existing understanding of the impact of financial factors on higher education enrolment in relation to other socio-cultural and academic factors. England, with its ongoing 'experiment' in student funding, presents both a fresh and a novel case with which to investigate more general relationships. Our study therefore addresses the academic literature as well as providing indications of the likely effects of recent and new English higher education student funding policies.

Debt and postgraduate study

English student funding context

England has witnessed considerable change in the arrangements for student funding at undergraduate level since 1998. Previously, UK and EU students were not liable for tuition fees and were eligible for means-tested maintenance grants (later loans). From 1998, tuition fees of maximum £1,000 per annum were introduced on a means-tested basis. From 2006, fees were increased to a maximum of £3,000, with student loans offered to cover these and

living costs. Finally, from 2012 the maximum fee was raised to £9,000, again with loans offered to cover these costs. Maintenance funding is more complex, with a unified grant system and devolved institutional bursaries targeted mainly towards those from low-income families. The most recent changes have seen grants replaced by means-tested additional loans and legislation to allow fees to rise above £9,000. The graduates in our study were undergraduates under the £3,000 regime.

In contrast, funding arrangements for postgraduate students have altered little. Essentially there has been scant state loan or grant funding for taught postgraduate study, outside specialist areas such as teacher training. Tuition fees for most courses are unregulated and vary substantially, with many being lower than at undergraduate level but in some areas reaching £20,000+. In 2011/12 the median taught postgraduate tuition fee was estimated at £4,605 (HEFCE, 2013a: 47). Around three-quarters of full-time UK-domiciled taught postgraduates have no financial sponsor and hence must pay fees from their own and/or their family's resources. Research students are much less likely to be self-funding – just over one-third fall into this category – although competition for state, charitable, institutional or industrial scholarships can be intense (BIS, 2015). Loans of up to £10,000 for postgraduate master's study became available in England from 2016 with loans of up to £25,000 for doctoral study arriving in 2018.

It is difficult to obtain reliable estimates of UK student debt levels, but given changes to student funding it is clear that they have increased substantially. Reviewing various evidence over the period 1994 – 2011, Bachan (2013) reports average borrowing approaching £25,000 by the end of the period. The maximum loan amount for an English-domiciled full-time undergraduate student on a three-year degree entering university in 2016 stands at £58,000 over the course of their degree¹. While this is a maximum, it compares unfavourably

with college debts in the USA, which were estimated to average \$28,400 (around £20,000) among the 69% of graduates who reported debts (Reed and Cochrane, 2014: 1).

Undergraduate student debts

Predictions that increased tuition fees would deter undergraduate enrolment seem not to have been realised. While there were dips in enrolment following fee increases in 1998, 2006 and 2012, these were followed by recovery in succeeding years. Statistics suggest that, contrary to expectation, participation rates for disadvantaged groups did not decline over this period, despite higher fees (Bolton, 2015). However there is some evidence to suggest that, faced with higher costs or higher debts, poorer students opt to study closer to home or look for institutions where living costs can be minimised (Wilkins *et al.*, 2013). Such studies tend to be carried out prospectively, with students reacting to different scenarios and/or predicting their own future behaviour, predictions which may be at odds with actual behaviour.

Other recent studies suggest attitudes to debt among students and potential students are changing rapidly under the new arrangements. Several studies report students accepting debt as a ‘fact of life’ to which they are resigned, or in a minority of cases which they embrace as opening up opportunities (Esson and Ertl, 2014; Harrison *et al.*, 2015a).

Personality emerges as more salient than socio-economic background in considering debt aversion (Harrison and Chudry, 2011; Harrison *et al.*, 2015b). Jones (2015) argues that debt aversion in the narratives of high-ability, socio-economically disadvantaged young people relates to the social and cultural, rather than financial, costs of higher education participation.

Student decision-making: expectations

Before considering pointers from previous research on debt and entry to postgraduate study, we first review *a priori* expectations. We consider three such predictions, which are not necessarily mutually exclusive. The first is the common-sense prediction which has dominated policy and media discussions of entry to postgraduate study in the UK: that higher undergraduate debts will constitute a straightforward deterrent to further study. A second possibility is that decision-making is driven by human capital considerations, whereby graduates in certain first-degree disciplines will anticipate greater labour market returns from postgraduate study. We might expect graduates from subject disciplines where there is no implied professional destination to be more likely to opt for postgraduate study, regardless of accumulated debt. Relative risk aversion theory comprises a third prediction. This posits that individuals' principal goal in educational decision-making is to avoid downward social mobility. Individuals will evaluate the risks and rewards of educational continuation using parental social class as their referent (Breen and Goldthorpe, 1997). This will generate social class inequalities since those who are already upwardly mobile by graduating from a first degree are, *ceteris paribus*, more likely to consolidate their gains in comparison with children of (say) parents from the higher professions, who may require a postgraduate degree to maintain their position. Larger undergraduate debts would be a greater deterrent for the upwardly mobile than the intergenerationally stable. All three predictions invoke a view of the student as *homo economicus*: a rational, calculating decision-maker who considers the potential effect of different post-graduation options for lifetime earnings (Marginson, 2015).

Debt and transition to postgraduate study

Almost all extant research on the effect of student debt on transition to postgraduate study concerns the USA. The comparatively high debt of American graduates may indicate the

likely future outcomes for English graduates in a high-debt regime, although there are important differences across the two contexts. Clearly, some graduates borrow extensively to finance postgraduate study. Belasco *et al.* (2014) report mean graduate borrowing of \$31,000 for masters degree recipients, \$56,000 for doctoral graduates and almost \$90,000 for first-professional graduate degrees. They show a range of factors as associated with accrued graduate debt, although they lack a direct measure of financial means or socio-economic background. Further, since their study focuses on successful postgraduates, it does not address the potential deterrent effect of undergraduate debts.

Several US studies have investigated the relationship between undergraduate debts and transition to postgraduate study, but no clear consensus emerges. Using the 1993/94 Baccalaureate and Beyond dataset, Millett (2003) found a negative relationship between undergraduate debts and enrolment in postgraduate study. More recently, Malcolm and Dowd (2011) reported a similar finding specifically for STEM graduates. However Zhang (2011), using the same dataset as Millett but retaining more cases, found debt was a deterrent only in defined circumstances (e.g. for public university graduates and for certain types of graduate programme). Finally English and Umbach (2016), using a later version of Baccalaureate and Beyond (2000/01) found no association whatsoever between undergraduate debt and transition to postgraduate study.

There are hardly any previous British studies of the relationship between undergraduate debt and transition to postgraduate study. Stuart *et al.* (2008) found, in a study of two new universities in the south of England, that final-year students with an aversion to debt were less likely to aspire to postgraduate study, although actual debt levels were unimportant. In 2013, the Higher Education Funding Council for England (HEFCE) conducted a survey of final-year 'home/EU' undergraduates as an addendum to the annual National Student Survey. This asked about students' postgraduate study intentions,

motivations and barriers and included data linkage to demographic and academic variables. HEFCE (2013b) reported that debt aversion featured prominently as a reason why students did not plan to enrol on a postgraduate programme, although overall cost considerations were most frequently cited. Students from less privileged socio-economic backgrounds were most likely to aspire to, but least likely to achieve transition to postgraduate study immediately following their first degree, but it is unclear whether actual debt was a factor in this discrepancy.

Other influences on postgraduate enrolment

Other factors have been identified as important in the transition to postgraduate study. There is little direct evidence of students' decision-making process in considering postgraduate study. At undergraduate level, students in England can have quite vague understanding of funding arrangements (Mangan *et al.*, 2010). There is some evidence that graduates too show a poor grasp of postgraduate funding arrangements in England (Mellors-Bourne, 2015).

Regarding non-financial factors, transition to postgraduate study is known to vary across field of study, with first-degree attainment also being a key predictor. There is also substantial variation across type of institution, with those from the most selective (and also socially exclusive) institutions most likely to enter postgraduate study. However non-academic factors are also influential, with some evidence that those from lower socio-economic backgrounds, minority ethnic groups, and women are less likely to enter postgraduate study, conditional on achieving a first degree (D'Aguiar and Harrison, 2015; English and Umbach, 2016; HEFCE, 2013b; Wakeling and Hampden-Thompson, 2013).

Methods

Data and Sample

Data for this paper were drawn from the Pathways Beyond Graduation (PbG) survey, a large-scale online survey of first-degree alumni from six English higher education institutions (HEIs). Full details of this survey are given in Hancock *et al* (2015). Data were collected during May/ June 2014. The six participating HEIs formed a consortium through funding from the pilot ‘Postgraduate Support Scheme’, an initiative launched by HEFCE to support capable but disadvantaged students to enter taught postgraduate study. The six HEIs are each members of the Russell Group, but vary in size - with postgraduate numbers ranging from fewer than 5,000 to over 10,000. Geographically the HEIs span the North West, North East and West Midlands of England. Combined, the six HEIs account for approximately 10% of UK-domiciled postgraduate students outside London (Strike and Toyne, 2015).

The PbG survey targeted all UK-domiciled first-degree alumni from the six HEIs, who had graduated in 2009 or 2012. Both cohorts would have been charged an annual undergraduate tuition fee of over £3,000, with 2009 alumni being the first year group potentially subject to this fee level. Data collected included the following: personal characteristics; academic background; graduating and present debt from undergraduate degree; activities since graduation (including applications to, offers for, and participation in, postgraduate study); recent employment history; and, future plans. The survey therefore enabled exploration of associations between graduates’ background characteristics, debt levels, and post-graduation trajectories.

Each HEI contacted their UK-domiciled 2009 and 2012 first-degree graduates directly with an email invitation to participate in the research. It is therefore acknowledged that a number of graduates within the sample frame may have been excluded from the study, owing

to incorrect contact details or having earlier opted out of communications from their HEI. Each graduate received a URL with a unique identifier that enabled the research team to monitor duplicate responses and to target reminders at non-respondents. An incentive scheme and prize draw were offered to encourage participation. The survey closed with a response rate of 8.4% ($n=2,849$). Response rates for each institution varied, between 6.0% and 11.4%. While the academic literature offers little consensus over what might constitute an ‘acceptable’ response rate, it is clear that responses to student surveys have fallen internationally over the last decade (Sid Nair *et al.* 2008). A bias analysis was undertaken to compare the sample with population data provided by each HEI in relation to key academic and personal variables with differences observed for undergraduate degree classification, gender and subject area. To mitigate this bias, post-stratification weights were derived and applied to the data during analysis so that the sample better reflected the research population².

UK HEIs form a diverse system, and it is noted that the universities participating in this particular study constitute a particular cluster. Nevertheless, many of the pressures facing UK HEIs, especially regarding postgraduate study, affect the whole sector. The recruitment and retention of UK-domiciled students and under-represented groups, and reform of student finance, are two significant examples. While it is therefore not possible to generalize these findings to other HEIs indiscriminately, it is likely that the results from this study will have resonance beyond its empirical base.

Variables and Data Analysis

Data from the PbG survey were subjected to a process of cleaning and analysis. Ineligible participants were removed from the dataset. The full list of JACS principal subject codes included in the survey were re-categorised using a new classification developed by Purcell

and colleagues (Ellison and Purcell, 2014). This classification derives from empirically-observed differences of graduates' aspirations and outcomes across the following five areas: Science, Technology, Engineering, Mathematics (and Medicine); Law, Economics and Management; Non-STEM academically-focused degrees, (Non-STEM) Vocationally-focused degrees; and Combined Studies. Undergraduate home postcode data were transformed into a POLAR3³ value to classify neighbourhoods, and information on parental employment status and occupation were allocated to a category within the National Statistics Socio-Economic Classification (NS-SEC). The 2,849 cases were then reduced further through listwise deletion of cases with missing data for the dependent variable of progression to postgraduate study. The final analytical sample was 2,567.

Progression to postgraduate study was our dependent variable. Respondents reported whether they were currently (in 2014) studying or had previously studied for a postgraduate degree. Of the former undergraduate students who participated in this study across the six institutions, 39% had progressed onto postgraduate study (see Table 1). Student debt was our main independent variable of interest as we wanted to explore whether undergraduate debt influenced postgraduate study progression. To collect this data, we asked participants to report how much debt they needed to repay at the point they had completed their undergraduate degree. They were asked only to include debt from undergraduate studies and not to include mortgages or debt that existed prior to their undergraduate studies. Given that some participants were either currently studying at the postgraduate level or had done so previously, we specifically asked them not to include this debt in their response. The response categories available to them were: no debt; ordinal bands increasing in increments of £5,000 up to £29,999; £30,000 and over; don't know; and refused. Additionally, we also asked them to indicate using the same response categories, their outstanding undergraduate debt at the time of the survey (i.e., 2014)..

It is important to recognize the challenges in collecting accurate financial information from research participants. The nature of our study meant reliance on self-reported data. Pinto and Mansfield (2006), in a study that examined student loan debt and debt repayment employed a similar method, asking US college students to report their current level of debt and expected level of debt at graduation. Similarly, Baum and O'Malley (2003) also used self-report debt data from the 2002 fourth Nellie Mae National Student Loan Survey (NASLS) to explore student debt and attitudes towards education debt. While not concerned with debt, many large-scale UK surveys rely on self-reported data for income, earnings, and benefits⁴. While we recognize the limitations to self-reported financially related data and the potential for observation error to arise, we remain confident given the similarities of our aggregate data to that of the Student Loan Company data that we have captured fairly the participants' levels of debt.

Participants were asked to indicate which sources funded their undergraduate tuition fees and living costs (e.g., student loan, fee waiver, income). In addition to the debt and funding source variables, the multivariate analyses included a number of control covariates. These variables clustered into the three broad areas of the participants' undergraduate degree characteristics (e.g., degree type), school characteristics (e.g., school type), socio-economic characteristics (e.g., parental occupations), and general background characteristics (e.g., gender).

Results

Our analysis proceeds in four stages. We begin with univariate analyses to determine the percentage of alumni who progressed or did not progress onto postgraduate study. Next, we examine levels of student debt by progression status and year of graduation before examining

the financial sources for tuition fees and living costs for both undergraduate and postgraduate (where applicable) students by progression status. Finally, we specify a series of logistic regression models to determine the association between levels of undergraduate debt and the likelihood of postgraduate transition, while controlling for key characteristics.

Table 1 shows progression to postgraduate study by year of undergraduate graduation. Of those undergraduates who graduated from the six institutions, 61% who responded to our survey had not, as of 2014, progressed to postgraduate study. In contrast, 39% had enrolled on a postgraduate degree. There were differences by graduating year, with 47% progressing from the 2009 cohort versus 35% from 2012. Not all undergraduates progress immediately to postgraduate study with some having a break, for various reasons, between degree courses (HEFCE, 2013a). Therefore, the 2009 cohort had a longer time in which to re-enter their studies.

Of those who reported entering postgraduate study, 34% were currently studying for their degree in 2013-2014 while 55% had already completed postgraduate study. A few (6%) had finished one postgraduate degree and were studying for a second. Typically these students had completed a taught postgraduate degree before continuing to a research degree (i.e., a PhD). These levels of progression are higher than for the UK sector as a whole, where about one in eight graduates entered a postgraduate degree as their ‘first destination’ in 2009/10 -2010/11. The difference reflects the focussed nature of our sample, with Russell Group⁵ graduates most likely to progress to postgraduate study (Wakeling and Hampden-Thompson, 2013)⁶. In our sample, 21% studied for a master’s degree, 9% for a research degree, and 5% a Postgraduate Certificate of Education (PGCE).⁷

[TABLE 1 ABOUT HERE]

Our principal objective is to examine the association of different levels of undergraduate student debt with transition to postgraduate study. Table 2 shows our participants' reported debt levels of debt. We were interested in both the amount of debt at graduation and the amount of debt at the time of the survey in 2014, which for the 2009 and 2012 cohorts was five and two years after graduation, respectively. Our data also allows comparison of debt levels by postgraduate transition status. For this reason, it is interesting to look at the overall percentage distribution for all students (see first column, Table 2). At time of graduation, almost half reported £20,000 or more undergraduate debt. Twenty per cent reported debts between £15,000 and £19,999, 10% between £10,000 and £14,999, 5% between £5,000 and £9,999, and 2% reported having some debt but less than £4,999. Across the two cohorts, 8% reported no undergraduate debt at all. Unsurprisingly, differences are apparent between the two cohorts: the 2012 cohort report greater levels of debt than the 2009 cohort. In terms of current debt, the 2009 cohort appear to have lowered their debt levels in the five years since graduation, with 27% reporting £20,000 or more of current debt compared to 36% for original debt.⁸

[INSERT TABLE 2 ABOUT HERE]

Turning our attention to whether graduates went on to postgraduate study or not highlights some small differences by debt level. Graduates who entered postgraduate study at some point were less likely to have original debts over £20,000 than those who had not made such transitions, although the difference between the two groups was not stark (45% versus 51% respectively). Differences can be found between the two cohorts. For example, in terms of original debt for the 2009 undergraduates, 32% of those who progressed to postgraduate

study reported debt levels of £20,000 or more compared to 39% of those who did not progress.

Table 2 includes data indicating what percentage of participants had paid off some debt⁹. We had anticipated that those graduating in 2009 were more likely, due to time, to have reduced their debt burden. This was the case with nearly a third (33%) of 2009 graduates having reduced their undergraduate debt compared with only 10% of the 2012 cohort. Comparing the 2009 cohort by progression status we can see that 41% of those that had not progressed had paid down some undergraduate debt as opposed to those that had to gone to study at this level (24%).

In data not shown here, we examined the differences in debt levels by postgraduate degree studied and found no discernible differences between those who studied for a postgraduate taught degree (master's) versus those who studied for a postgraduate research degree. The percentages of postgraduate taught and postgraduate research reporting debt over £25,000 were both 14%.

Understanding which sources these students drew from to fund their undergraduate degrees provides insight in to how their debt is structured. To explore this, we asked participants to indicate the various financial sources used to fund their tuition as well as living costs. It should be noted that they could indicate multiple choices, so the data represents percentages and not a percentage distribution. In data not shown here, most (>80%) reported funding undergraduate tuition and living costs with a formal loan. Undergraduate living costs were also mainly supported by formal loans (82%), supplemented in some cases (41%) by income from a job and/or a gift from a family member or acquaintance (35%). Differences between those who progressed or not to postgraduate study and by year of graduation were negligible.

For those who have progressed to postgraduate study, we wanted to know how they were funding or had funded their tuition fees (see Table 3). As might be predicted, the profile of funding sources varies considerably from undergraduate level. Since, at the time of writing postgraduate loans were not widely available in England, very few could secure any type of loan to pay for their tuition fees (11%). Just under one third (29%) received a research studentship and around one-fifth reported funding their tuition either in whole or part with sponsorship (21%) or personal savings (23%).

[INSERT TABLE 3 ABOUT HERE]

Differences were observed between those studying for a postgraduate degree in 2013-14 versus those who had studied prior to that academic year. This was particularly noticeable when comparing the percentages for research studentships (31% versus 11%, respectively) and sponsorship (21% versus 11%, respectively). A larger percentage of current than former postgraduates also reported relying on a family or acquaintance gift, in whole or part, to fund their tuition fees (25% versus 12%, respectively).

Given the differences in funding arrangements for postgraduate study, we considered the source of tuition funding by type of degree (Table 4). This analysis highlights the differences in funding sources between postgraduates on master's programmes versus those pursuing research degrees. Over two-thirds of research degree students (68%) were funded through a research studentship compared with 11% of master's students. Master's students when compared to research students seem to draw from several sources with a greater percentage than research students relying on family loans, gifts, savings and income from a job to fund their tuition.

[INSERT TABLE 4 ABOUT HERE]

In order to estimate the association between levels of undergraduate debt and postgraduate transitions, we conducted a series of logistic regressions. Given the variability observed concerning type of postgraduate degree, and for reasons of space, we specify models for postgraduate taught transitions only. In our logistic regressions, we control for several covariates (see Table 5) which previous research indicates are associated with transition to postgraduate level.

Table 5 contains the logistic regression coefficients standard errors and odds ratios for undergraduates who are currently studying or previously studied for a postgraduate taught degree. The odds ratios¹⁰ provide an indication of the likelihood that a graduate, with a certain level of student debt and other related background characteristics will continue on to postgraduate taught study. Model 1 is parsimonious with only levels of original undergraduate debt as the predictor. With this single predictor, alumni with very high debts (over £20,000) were most likely to proceed to postgraduate study, whereas those with lower debt levels were somewhat less likely than graduates with no debt to make that transition. However, none of these differences were statistically significant.

[INSERT TABLE 5 ABOUT HERE]

In Model 2, we added covariates covering undergraduate degree characteristics. The introduction of these control variables did not substantially alter the odds of graduates with different debt levels proceeding to postgraduate study, and debt remained statistically insignificant. As expected, 2012 graduates were less likely to have progressed to postgraduate study ($OR = 0.55$) than those graduating in 2009. Those who completed a STEM or

academically-focused subject were more likely to progress to a postgraduate taught degree than those who studied a Law, Economics or Management or a vocationally-focussed degree. In addition, those with the ‘good’ degree classifications of first or upper second class honours were more likely to progress than those with lower classifications ($OR = 2.82$ and $OR = 1.96$, respectively). This was unsurprising since many postgraduate courses require a good honours degree.

Model 3 represents the fully specified model with the inclusion of school characteristics, socioeconomic and background characteristics. The association between level of debt and postgraduate progression remains statistically insignificant with little change in the coefficients compared to previous models. A series of socioeconomic variables were also added in Model 3. These included parents’ participation in higher education, parents’ occupational level, widening participation activity, and neighbourhood participation in higher education (POLAR3). While prior research has shown these to be related to participation in undergraduate education (Moore *et al.*, 2013), only parental higher education participation was associated with transition to postgraduate taught study. Specifically, former undergraduate students with two parents with higher education ($OR = 1.25$) were more likely to progress to postgraduate education than those students whose parents had not been to university. It is interesting to note that two traditional predictors of access to higher education – parental occupational social class and micro-neighbourhood - were not associated with progression to postgraduate education for graduates of this set of institutions.

Finally, we turn our attention to the association between student gender, age, and ethnicity with postgraduate progression. No discernible associations were found by gender and age but our results did indicate that mixed ethnicity students were significantly more likely to progress to postgraduate studies than their white counterparts ($OR = 1.83$).

It is worth observing that the pseudo r^2 values for the models are low. While low values are not unusual for logistic regression, it is surprising given our dataset incorporates the principal academic and demographic variables utilised in this field. It may mean there are important, perhaps individual factors which are not observed. It is possible that, through their selection into this set of universities, our graduates are alike in ways we could not measure. This certainly fits with the known stratification of postgraduate transitions by institution type (Wakeling and Hampden-Thompson, 2013).

Conclusion

Among this group of respondents – 2009 and 2012 UK-domiciled first-degree graduates from six Russell Group universities – we saw limited association of debt levels with progression to postgraduate study. Those with above-average levels of student debt were slightly *more* likely to enrol as postgraduates. Thus the widely-held assumption that higher undergraduate debts will be associated with lower postgraduate enrolment does not bear scrutiny. There is however limited support for our second prediction. Graduates from vocational disciplines and from law, economics and management are less likely than those from academically-focussed disciplines and STEM subjects to have entered a taught postgraduate degree. However STEM graduates – who we would expect to find a favourable graduate labour market – were significantly more likely than those from academically-focused degrees to have stayed on.

We deduce that debt *per se* is not the salient factor in postgraduate enrolment for our graduates. While it will undoubtedly be significant for particular individuals, we do not see substantial systematic differences in progression by levels of debt. Rather we postulate that *underlying financial resources*, unobserved in our data, more strongly influence postgraduate enrolment. As funding for undergraduate study in England has shifted to loans, there is likely to be less variation in debt levels among undergraduates, who will nearly all be obliged to

(and be inured to) borrow to cover tuition fees and living costs. In the absence of systematic funding for taught postgraduate programmes, graduates need independent financial means to pay tuition fees and cover their living costs. This is especially true for early-career graduates who are less likely to be able to call on employer support. There are clear differences in the financial support parents can provide to undergraduate children, with many affluent families extending this support into later adulthood (Houle, 2013; West *et al.*, 2015).

While the new postgraduate loans on offer in the UK from 2016 will help somewhat, it is unlikely that the amount available will cover the full costs of postgraduate study. Moreover, the loans may actively worsen the situation since the financially advantaged will be best-placed to take them up and a substantial increase in master's enrolments could deflate the value of a bachelor's degree. We also cannot be sure of the effect of considerably higher undergraduate debts (from 2015) on postgraduate enrolment. There are no direct indications in our findings to suggest a deterrent effect from vastly increased undergraduate tuition fees (and debt), but this remains an open empirical question.

Support for relative risk aversion theory is limited in our dataset: children of graduate parents are more likely to transition to postgraduate study, but occupational and neighbourhood measures show weak associations with postgraduate enrolment which are statistically significant. Within this set of universities, degree-level attainment appears more prominent in postgraduate transition than socio-economic background. We need to recall that there is a known link between type of university attended for the first degree and progression to postgraduate study (Wakeling and Hampden-Thompson, 2013). Graduates from lower socio-economic class backgrounds are underrepresented in those universities with the highest rates of transition to postgraduate study. Conditional on entering such universities however, their subsequent odds of postgraduate enrolment does not differ significantly from their more advantaged peers. Accordingly, research-intensive universities seeking to widen participation

at postgraduate level should not limit their attention to student finance. They would benefit from broadening their first-degree entry to expand the pool of potential recruits, as well as looking beyond their own graduates to diversify their intake. Widening postgraduate participation more generally will mean a central role for those institutions which have a stronger track record of widening participation at undergraduate level.

Finally, we hope that our study helps to stimulate research into the longer-term implications of hugely increased student debts for graduates. Very little is known about the effect of large student debts on British graduates' subsequent fortunes, including household formation, lifestyle, fertility, well-being, occupational and geographical mobility. Research on US students with excessive debts suggests they suffer material, personal and emotional consequences (Kantrowitz, 2015). While we do not detect – yet – a clear debt-based deterrent to postgraduate enrolment, that does not mean that spiralling student debts are inconsequential.

Notes

¹ Amount based on a full-time UK-domiciled undergraduate without dependants or a disability but with a low household income starting in September 2016 and studying in London. Source: Student Finance England website: <https://www.gov.uk/student-finance-calculator> (accessed 19 January 2016).

² See Hancock *et al* (2015) for full details of the weighting procedure.

³ A classification categorising UK areas in quintiles according to HE participation rates. See: <http://www.hefce.ac.uk/analysis/yp/POLAR> (accessed 4 August 2016)

⁴ See the working paper by Hansen and Kneale (2011) for discussion and analysis of self-report income data in large-scale UK surveys.

⁵ The Russell Group represents 24 research-intensive British universities, sometimes seen as a British 'Ivy League'.

⁶ Nevertheless, there remains a probability of over-representation of those making the transition to postgraduate study within our survey dataset, even following weighting.

⁷ Categories not mutually exclusive.

⁸ We would expect 2009 graduates of four-year programmes to have lower debt as they entered university on a lower-fee regime. Four-year graduates in 2012 would conversely have higher debt as they had an extra year of higher fees compared to three-year graduates. As a sensitivity check, we re-ran our models excluding four-year graduates; while these gave a slightly better model fit, there were no substantive changes in coefficients.

⁹ This variable compares students' original reported debt and that they reported in 2014. If debt was lower, they were coded as having reduced their debt. The last row of Table 2 simply reports the percentage of students who had less debt in 2014 than at graduation.

¹⁰ The validity of comparing odds ratios across logistic regression models has been questioned in an influential article by Mood (2010). There is insufficient space to fully review the arguments here; briefly, she argues that

adding variables to models or comparing across datasets changes the effects of the variables already in that model. Essentially this is equivalent to regression as representing the *latent propensity* for an event to occur. Because the variable is latent, we do not know its scale, which is the residual variance. If the residual variance changes, as it will when a new variable is added to the model, then the scale changes. Mood (2016) suggests using marginal effects, instead of odds ratios, as a means of overcoming this problem.

Buis (2016) has in turn criticised Mood's argument on the basis that it relates to a particular interpretation of the dependent variable, i.e. where it is taken as a manifestation of an unobserved latent propensity. For Buis, this does not apply to many educational research questions where whether an event actually occurred. That is the case with our investigation of whether or not graduates proceed to postgraduate study. The logit approach.

Acknowledgements

The research was funded under HEFCE's Postgraduate Support Scheme 2014-15 (ref. G0166). We are grateful to colleagues at participating institutions for support across the research and to our respondents for their time and interest. We thank Stacey Bielick and Kate Purcell for suggestions on the survey; Neil Harrison and two anonymous reviewers for comments on an earlier draft; and Andy Field for statistical advice.

References

- Bachan, R. (2013) Students' expectations of debt in UK higher education. *Studies in Higher Education*, 39, 5, 848 – 873.
- Baum, S. and O'Malley, M. (2003). *College on credit: How borrowers perceive their education debt. Results of the 2002 National Loan Survey (Final Report)*. Braintree, MA: Nellie Mae.
- Belasco, A. S., Trivette, M. J. and Webber, K. L. (2015) Advanced degrees of debt: analyzing the patterns and determinants of graduate student borrowing. *Review of Higher Education*, 37, 4, 469 – 497.
- BIS (Department for Business, Innovation and Skills) (2015). *Consultation on Support for Postgraduate Study*. London: BIS.
- Bolton, P. (2015) *Tuition Fee Statistics (Briefing Paper Number 917)* (London, House of Commons Library).

Breen, R. and Goldthorpe, J. H. (1997) Explaining educational credentials: towards a formal rational action theory. *Rationality and Society*, 9, 3, 275 – 305.

Buis, M. (2016) Logistic regression: When can we do what we think we can do? Unpublished working paper, available at: http://www.maartenbuis.nl/wp/odds_ratio_2.3.pdf (accessed 2 May 2017).

D'Aguiar, S. and Harrison, N. (2015) Returning from earning: UK graduates returning to postgraduate study, with particular respect to STEM subjects, gender and ethnicity. *Journal of Education and Work*. DOI: 10.1080/13639080.2014.1001332.

Ellison, R. and Purcell, K. (2014). *Addressing the research questions via Futuretrack data analysis: Final Report*. Coventry: Institute for Employment Research, University of Warwick.

English, D. and Umbach, P. D. (2016) Graduate school choice: an examination of individual and institutional effects. *The Review of Higher Education*, 39, 2, 173 – 211.

Esson, J. and Ertl, H. (2014) No point worrying? Potential undergraduates, study-related debt, and the financial allure of higher education. *Studies in Higher Education*. DOI: 10.1080/03075079.2014.968542.

Hancock, S., Wakeling, P. and Hampden-Thompson, G. (2015) *Technical Supplement to the Understanding the Student Strand Report* (Sheffield: University of Sheffield).

Hansen, K. and Kneale, D. (2011). Does how you measure income make a difference to measuring poverty? CLS Working Paper 2011/1. London: Centre for Longitudinal Studies.

Harrison, N., Agnew, S. and Serido, J. (2015) Attitudes to debt among indebted undergraduates: a cross-national exploratory factor analysis. *Journal of Economic Psychology*. DOI:10.1016/j.joep.2014.11.005.

Harrison, N. and Chudry, F. (2011) Overactive, overwrought or overdrawn? The role of personality in undergraduate financial knowledge, decision-making and debt. *Journal of Further and Higher Education*, 35, 2, 149 – 182.

Harrison, N., Chudry, F., Waller, R. and Hatt, S. (2015) Towards a typology of debt attitudes among contemporary young UK undergraduates. *Journal of Further and Higher Education*, 39, 1, 85 - 107.

HM Treasury (2016) *Budget 2016* (HC 901).

Higher Education Funding Council for England (HEFCE) (2013a) *Postgraduate education in England and Northern Ireland: Overview report 2013* (Bristol, HEFCE).

Higher Education Funding Council for England (HEFCE) (2013b) *Trends in transition from first degree to postgraduate study: qualifiers between 2002-03 and 2010-11* (Bristol, HEFCE).

Houle, J. N. (2013) Disparities in debt: parents' socioeconomic resources and young adult student loan debt. *Sociology of Education*, 87, 1, 53 – 69.

Jones, S. (2015) Expressions of student debt aversion and tolerance among academically able young people in low-participation English schools. *British Educational Research Journal*. DOI: 10.1002/berj.3209.

Kantrowitz, M. (2015) *Who Graduates with Excessive Student Loan Debt?* Available at <http://www.studentaidpolicy.com/excessive-debt/> (accessed 4 July 2016).

Malcolm, L. E. and Dowd, A. C. (2011) The impact of undergraduate debt on the graduate school enrollment of STEM baccalaureates. *The Review of Higher Education*, 35, 2, 265 – 305.

Mangan, J., Hughes, A. and Slack, K. (2010) Student finance, information and decision making. *Higher Education*, 60, 5, 459 – 472.

Marginson, S. (2015) *Education, work and 'employability' foundational problems of human capital theory*. SRHE Conference, Newport, Wales, 9 December.

Mellors-Bourne, R. (2015) *Recent Graduates' Perspectives on Access and Progression to Taught Postgraduate Study* (Cambridge: CRAC).

Millett, C. M. (2003) How undergraduate loan debt affects application and enrollment in graduate or first professional school. *The Journal of Higher Education*, 74, 4, 386 – 427.

Mood, C. (2010) Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It. *European Sociological Review*, 26, 1, 67 – 82.

Moore, J., Sanders, J. and Higham, L. (2013) *Literature Review of Research into Widening Participation to Higher Education: Report to HEFCE and OFFA by ARC Network* (Bristol, HEFCE).

National Union of Students (2012) *Steps Towards a Fairer System of Postgraduate Funding in England* (London, NUS.).

Organisation for Economic Co-operation and Development (2015) *Education at a Glance 2015* (Paris, OECD).

Pinto, M. B. and Mansfield, P. M. (2006) Financially At-Risk College Students: An Exploratory Investigation of Student Loan Debt and Prioritization of Debt Repayment. *Journal of Student Financial Aid*, 36 (2), 22 – 32.

Reed, M. and Cochrane, D. (2014) *Student Debt and the Class of 2013* (Washington DC, the Institute for College Access and Success).

Sid Nair, C., P. Adams and P. Mertova. (2008) Student Engagement: The Key to Improving Survey Response Rates. *Quality in Higher Education*, 14, 3, 225 – 232.

Social Mobility and Child Poverty Commission. (2013). *Higher Education: the Fair Access Challenge* (London, Social Mobility and Child Poverty Commission).

Strike, T. and Toyne, J. (2015) Our approach, in: T. Strike and J. Toyne (Eds) *Postgraduate Support Scheme: Widening Access to Postgraduate Study and Fair Access to the Professions* (Sheffield, University of Sheffield).

Stuart, M., Lido, C., Morgan, M., Solomon, L. and Akroyd, K. (2008) *Widening Participation to Postgraduate Study: Decisions, Deterrents and Creating Success* (York, Higher Education Academy).

Wakeling, P. and Hampden-Thompson, G. (2013) *Transition to Higher Degrees Across the UK: an Analysis of National, Institutional and Individual Differences* (York, Higher Education Academy).

Walker, I. and Zhu, Y. (2013) *The Impact of University Degrees on the Lifecycle of Earnings: Some Further Analysis* (London, Department for Business, Innovation and Skills).

West, A., Roberts, J., Lewis, J. and Noden, P. (2015) Paying for higher education in England: funding policy and families. *British Journal of Educational Studies*, 63, 1, 23-45.

Wilkins, S., Shams, F. and Huisman, J. (2013) The decision-making and changing behavioural dynamics of potential higher education students: the impacts of increasing tuition fees in England. *Educational Studies*, 39, 3, 125 – 141.

Zhang, L. (2013) Effects of college educational debt on graduate school attendance and early career and lifestyle choices. *Education Economics*, 21, 2, 154 – 175.

Table 1. Percentage and frequency of progression to postgraduate study and progression status by year of undergraduate graduation.

Progression to postgraduate study	Total		2009		2012	
	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency
Not progressed to postgraduate study	61.0	1,526	53.3	488	65.3	1,038
Progressed to postgraduate study	39.1	1,041	46.7	447	34.7	594
Progression status						
Currently undertaking PG study	33.8	362	18.6	83	45.6	279
Currently undertaking PG study and previously studied at level	6.5	69	10.0	45	3.8	24
Previously undertaken PG study	55.4	571	69.2	309	44.7	262
Other	4.4	39	2.3	10	6.0	29

Note: Weighted percentages.

N=2,567

Table 2. Percentage distribution of original and current undergraduate debt and change in debt by postgraduate degree status and year of undergraduate graduation.

Undergraduate debt	All			Currently or previously studied for a postgraduate degree			Neither studying or previously studied for a postgraduate degree		
	Total	2009	2012	Total	2009	2012	Total	2009	2012
Original debt at time of graduation									
No debt	7.9	6.8	8.5	8.4	7.1	9.5	7.6	6.6	8.0
£1 - £4,999	1.8	1.4	2.0	1.3	1.4	1.2	2.1	1.5	2.3
£5,000 - £9,999	4.7	5.2	4.5	4.5	5.8	3.5	4.9	4.6	5.0
£10,000 - £14,999	9.1	13.5	6.6	10.0	14.6	6.4	8.6	12.5	6.7
£15,000 - £19,999	21.1	32.5	14.6	24.6	33.7	17.5	18.9	31.5	13.0
£20,000 - £24,999	31.6	27.9	33.7	28.9	24.0	32.8	33.3	31.4	34.2
over £25,000	17.1	7.8	22.5	15.6	8.1	21.5	18.1	7.5	23.1
Don't know/Prefer not to say	6.6	4.9	7.6	6.6	5.3	7.5	6.6	4.5	7.7
Current debt as of 2014									
No debt	11.6	13.9	10.3	12.1	12.2	12.0	11.3	15.4	9.4
£1 - £4,999	2.0	1.9	2.0	1.5	2.3	1.0	2.3	1.7	2.6
£5,000 - £9,999	5.3	7.1	4.3	4.9	6.7	3.5	5.5	7.3	4.7
£10,000 - £14,999	9.5	14.7	6.5	9.2	13.5	5.8	9.7	15.8	6.9
£15,000 - £19,999	18.9	24.8	15.5	18.2	21.4	15.7	19.3	27.7	15.3
£20,000 - £24,999	26.1	22.4	28.2	27.5	26.0	28.7	25.2	19.3	27.9
over £25,000	15.6	4.7	21.9	16.4	7.0	23.8	15.1	2.7	20.9
Don't know/Prefer not to say	11.0	10.5	11.4	10.2	11.0	9.6	11.6	10.1	12.3
Reported less debt in 2014 than original debt	18.6	32.9	10.4	14.4	23.8	7.0	21.4	40.8	12.2

Note: Weighted percentages.

N=2,567

Table 3. Financial source of postgraduate tuition fees by year of undergraduate graduation (percent).

Financial source	Total	Currently studying for a postgraduate degree ⁱ			Previously studied for a postgraduate degree ⁱⁱ		
		Total	2009	2012	Total	2009	2012
Formal loan (e.g. bank)	10.9	8.8	5.6	10.3	18.9	19.4	18.2
Loan from family/ personal acquaintance	16.7	11.4	6.7	13.4	18.1	14.9	22.2
Gift from family/ personal acquaintance	5.6	12.3	7.9	14.2	25.3	22.4	28.9
Fee waiver (e.g., departmental scholarship)	6.6	9.5	9.5	9.5	8.7	5.6	12.6
Sponsorship (e.g., employer, armed services)	21.0	21.3	24.6	19.8	10.7	11.6	9.6
Research studentship (e.g. UK Research Council)	29.2	30.7	36.4	28.1	11.1	15.6	5.6
Government grant	5.9	4.8	6.2	4.2	7.8	8.4	7.0
Income from a job	15.0	13.7	21.2	10.3	16.1	17.2	14.6
Personal savings	22.7	19.7	18.5	20.3	26.4	23.5	30.0
Other	7.0	6.2	6.6	6.0	4.6	4.5	4.7

ⁱ If the current postgraduate student has previously studied for a postgraduate degree, we report here how they financed this current degree study.

ⁱⁱ If the postgraduate student has studied for more than one postgraduate degree, we report here how they financed their most recent postgraduate degree.

Note: Weighted percentages.

N=2,567

Table 4. Financial source of postgraduate tuition fees by postgraduate degree type (percent).

Financial source	Masters degree (PGT)	Research degree (PGR)
Formal loan (e.g. bank)	9.4	2.1
Loan from family/ personal acquaintance	13.7	4.5
Gift from family/ personal acquaintance	17.6	4.2
Fee waiver (e.g., departmental scholarship)	8.4	14.2
Sponsorship (e.g., employer, armed services)	24.9	9.9
Research studentship (e.g. UK Research Council)	11.2	67.8
Government grant	3.0	2.1
Income from a job	21.8	5.5
Personal savings	24.6	9.7
Other	6.9	4.2

Note: If the postgraduate student has studied for more than one postgraduate degree, we are reporting here how they financed their most recent postgraduate degree.

Weighted percentages.

N=2,567

Table 5. Logistic regression coefficients, standard errors and odd ratios for transition to taught postgraduate study.

Variables	Model 1			Model 2			Model 3		
	β	SE	Odds Ratio	β	SE	Odds Ratio	β	SE	Odds Ratio
Debt									
Debt repayment (original debt) (ref: no debt)									
£1 - £4,999	-0.39	0.32	0.68	-0.50	0.32	0.61	-0.54	0.35	0.58
£5,000 - £9,999	-0.12	0.20	0.89	-0.12	0.21	0.89	-0.18	0.23	0.83
£10,000 - £14,999	-0.05	0.16	0.95	-0.18	0.16	0.83	-0.19	0.18	0.83
£15,000 - £19,999	-0.05	0.13	0.95	-0.07	0.13	0.93	-0.04	0.15	0.96
£20,000 and over	0.10	0.12	1.10	0.16	0.12	1.18	0.16	0.13	1.18
Undergraduate degree characteristics									
Year of UG graduation (ref: 2009)									
2012				-0.60	0.09	0.55 **	-0.78	0.11	0.46 **
UG degree type (ref not integrated Masters)									
Integrated Masters degree				-0.18	0.16	0.83	-0.16	0.18	0.85
UG Subject (ref: Academic focused)									
STEM, including Medical				0.28	0.10	1.32 **	0.34	0.11	1.41 **
Law, Economics and Management				-0.25	0.18	0.78	-0.28	0.20	0.76
Vocationally-focused				-0.21	0.15	0.81	-0.13	0.17	0.88
Combined Studies				-0.04	0.18	0.96	-0.16	0.20	0.85
UG degree classification (ref: lower second or below)									
1st class				1.04	0.14	2.82 **	1.00	0.15	2.72 **
Upper second				0.67	0.13	1.96 **	0.62	0.14	1.86 **
School characteristics									
Highest pre UG qualification (ref: other)									
GCE 'A' level							0.06	0.24	1.06
School type (ref: state)									
Private/independent							0.03	0.12	1.03

Variables	Model 1			Model 2			Model 3		
	β	SE	Odds Ratio	β	SE	Odds Ratio	β	SE	Odds Ratio
Socio-economic characteristics									
Widening participation programme (ref: yes)									
No							0.07	0.11	1.07
Parental Higher Education (ref: no parent went to HE)									
One parent							0.10	0.12	1.11
Two parents							0.22	0.11	1.25 *
Parental occupation (ref: low)									
Middle							-0.17	0.11	0.85
Highest							-0.11	0.12	0.90
Neighbourhood participation in higher education (ref: quintile 1[lowest])									
Quintile 2							0.17	0.17	1.19
Quintile 3							0.20	0.16	1.22
Quintile 4							0.18	0.15	1.20
Quintile 5							0.23	0.15	1.25
Background characteristics									
Gender (ref: female)									
Male							-0.10	0.09	0.91
Age in years							-0.03	0.02	0.97
Ethnicity (ref: white)									
Black							-0.14	0.44	0.87
Asian							0.00	0.21	1.00
Mixed							0.53	0.26	1.70 *
Constant	-0.46	0.08	**	-0.75	0.15	**	0.39	0.96	
-2 Log-likelihood	3427.9			3344.3			2769.2		
Pseudo r^2	0.0019			0.0447			0.0591		
Number	2,567			2,567			2,567		

*= p 0.05, **= p 0.01

